

LIST OF CLAIMS PENDING

Claims 1-15 (cancelled)

16. (Previously presented) A method for providing fire prevention in an aircraft having an engine, and a compartment, by producing oxygen-depleted air from a bleed air received from said engine, said method comprising:

separating said bleed air into an oxygen-enriched gas mixture and an oxygen-depleted gas mixture;

removing said oxygen-enriched gas mixture by discharging it outside the aircraft;

supplying said oxygen-depleted gas mixture into a compartment inside said aircraft for establishing therein a hypoxic fire prevention environment; maintaining the oxygen content in said hypoxic fire prevention environment in the range from greater than 12% to approximately 16% of oxygen.

17. (Previously presented) The method of claim 16, wherein the aircraft compartment further comprises a cargo compartment, and the method further comprises the step of:

supplying said oxygen depleted gas mixture into said cargo compartment; and

maintaining said hypoxic fire prevention environment in said cargo compartment.

18. (Previously presented) The method of claim 16, wherein in case of an emergency, supplying said oxygen enriched gas mixture, via respiratory masks, to passengers and crew in said aircraft;

automatically deploying this supply when a signal from a smoke and fire detection system received or a depressurization of the cabin being detected.

19. (Previously presented) The method of claim 17, wherein said cargo compartment is constantly ventilated with said oxygen depleted gas mixture having oxygen content from 12% to 15.5%.

20. (Previously presented) The method according to claim 16, further comprising mixing of said oxygen-depleted gas mixture with said bleed air to increase and regulate the oxygen content in said aircraft compartment;

said hypoxic gas mixture from said mixing device being supplied in amount equal to or larger than any air leaking from said aircraft compartment allowing to maintain a desired oxygen content by ventilating the compartment with said hypoxic mixture.

21. (Previously presented) The method according to claim 16, wherein said oxygen-depleted gas mixture is supplied directly into said compartment allowing to achieve and maintain the desired oxygen content by diluting said compartment's atmosphere with the oxygen-depleted gas mixture.

22. (Previously presented) The method according to claim 17, wherein said oxygen-depleted gas mixture is used to propel water through a special nozzle for generating water mist inside said aircraft compartment to suppress a fire.

23. (Withdrawn) The method according to claim 17, wherein said oxygen-depleted gas mixture is used to propel a foam generating solution through a foam producing device for generating hypoxic fire-extinguishing foam inside a protected compartment.

24. (Previously presented) The method according to claim 16, wherein

a plurality of oxygen-separation membranes is used for separating said bleed air by connecting them in parallel in a single unit, so a failure of one membrane does not affect significantly the performance of the whole device.

25. (Previously presented) The method according to claim 16, wherein a plurality of pressure-swing adsorption units is used for separating said bleed air by connecting them in parallel in one module, so a failure of one unit does not affect significantly the performance of the whole device.

26. (Previously Presented) The method according to claim 16, wherein providing of a pressurized container having sufficient amount of said hypoxic air in order to flood or accelerate the flooding of said aircraft compartment and establishing there a breathable fire-extinguishing atmosphere in a case of a fire.

27. (Previously presented) The method according to claim 16, wherein a cryogenic method is used for producing nitrogen and oxygen from atmospheric air and said oxygen-depleted gas mixture being made by mixing nitrogen with the bleed air.

28. (Previously presented) A system for providing fire prevention in an aircraft, said aircraft having an engine, and at least one compartment, by producing oxygen-depleted or hypoxic air, said system comprising:

an air-separation device receiving air and separating said air into first and second gas mixtures; said first gas mixture being oxygen-enriched air and said second gas mixture being oxygen-depleted air;

a venting means for releasing said first gas mixture outside the aircraft;

means for supplying said second gas mixture into said compartment for ventilation and maintaining there a constant hypoxic fire-preventive environment in order to prevent ignition that can lead to explosion or fire; wherein the oxygen content in said fire-preventive environment is maintained above 12% and below 16%.

29. (Previously presented) The system according to claim 28, wherein the aircraft compartment comprises a passenger cabin, further comprising a pressurized container having sufficient amount of said hypoxic air in order to flood or accelerate the flooding of the passenger cabin and establish there a breathable fire-extinguishing atmosphere in a case of a fire.

30. (Previously Presented) The system according to claim 28 further comprising
a mixing device for providing, when needed, the mixing of said oxygen-depleted gas mixture with said air in order to increase and regulate the oxygen content in said aircraft compartment;
a smoke and fire detection system with sensors installed in said aircraft compartment;
an oxygen content monitoring system providing oxygen content data in said aircraft compartment; and
a computerized control panel for receiving and analyzing data from the smoke and fire detection and oxygen monitoring systems and regulating the oxygen content in said aircraft compartment.

31. (Previously presented) The system according to claim 28 further comprising means for supplying said second gas mixture directly into said aircraft compartment in order to achieve and maintain a designed oxygen content by ventilating the compartment with the oxygen-depleted gas mixture.

32. (Previously presented) The system according to claim 28 wherein said second gas mixture having oxygen content greater than 10%.
33. (Previously presented) The system according to claim 28, further comprising means for propelling water by said second gas mixture through a special nozzle for generating water mist inside said aircraft compartment.
34. (Withdrawn) The system according to claim 28 and a foam producing device for generating hypoxic foam inside the protected compartment by propelling foam generating solution with said second gas mixture.
35. (Previously presented) The system according to claim 28, wherein said air-separation device includes a plurality of oxygen-separation membranes connected in parallel in a single unit, so a failure of one membrane does not affect significantly the performance of the whole device.
36. (Previously presented) The system according to claim 28, wherein said air-separation device includes a plurality of pressure-swing adsorption modules connected in parallel in a single unit, so a failure of one such module does not affect significantly the performance of the whole device.
37. (Previously presented) The system according to claim 28, wherein said air-separation device is a cryogenic unit producing nitrogen and oxygen from air and said second gas mixture is made by mixing nitrogen with the bleed air.
38. (Currently amended) A method for extinguishing fires using water mist propelled by hypoxic air, said method comprising:

producing hypoxic air in an air-separation device and providing it under pressure for propulsion of water through a water mist generating nozzle;

supplying the system with water for propelling it by said hypoxic air;

producing water mist in a water mist generating nozzle by propelling water with hypoxic air;

when deployed, said system generates and releases water mist inside a protected area, said water mist propelled by said hypoxic air that simultaneously gradually dilutes the internal atmosphere and decreases its oxygen content to [the] a fire extinguishing level;

the oxygen content in said hypoxic air propelling water mist being above 12% and below 16%;

producing water mist for the period of time needed to establish said fire-extinguishing level; said method designated for extinguishing fires in aircraft, marine vessels, buildings, all type of vehicles and other enclosed and semi-enclosed structures.

39. (Currently Amended) A system for extinguishing fires using water mist propelled by hypoxic air, said system comprising:

an air-separation device providing hypoxic air under pressure for propulsion of water through a water mist generating nozzle;

a water tank for supplying the system with water propelled by said hypoxic air; a water mist generating nozzle producing water mist propelled by hypoxic air;

when deployed, said system generates and releases water mist inside a protected area, said

water mist propelled by said hypoxic air that simultaneously gradually dilutes the internal atmosphere and decreases its oxygen content to [the] a fire extinguishing level;

the oxygen content in said hypoxic air propelling water mist being above 12% and below 16%;

the amount of water in said water tank being calculated to be sufficient to produce water mist for the period of time needed to establish said fire-extinguishing level;

said system designated for extinguishing fires in aircraft, marine vessels, buildings, all type of vehicles and other enclosed and semi-enclosed structures.

40. (Previously presented) A method of extinguishing fires in aircraft, marine vessels and other vehicles, buildings and tunnels, having a space to be protected said method comprising:

a dilution of the atmosphere in the protected space with hypoxic air having oxygen content below 16% until a fire-extinguishing atmosphere is created;

a maintaining said fire-extinguishing atmosphere at a designed oxygen content level for as long as needed by ventilating said protected space with the hypoxic air with oxygen content ranging from above 12% to 16%.

41. (Previously presented) A method of extinguishing fires in aircraft, marine vessels and other vehicles, buildings and tunnels, said method comprising:

a mixture of water mist and hypoxic air having oxygen content above 12% and below 16%;
said mixture being generated by propulsion of water through a special mist generating
nozzle using hypoxic air;

said mixture, propelled with said hypoxic air, being released into protected area, which
allows to rapidly control and extinguish a fire.

42. (Withdrawn) A method of extinguishing fires in aircraft, marine vessels and other vehicles,
buildings and tunnels, said method comprising:

a mixture of foam and hypoxic air having oxygen content below 16%; said mixture being
generated by propulsion of a foam generating solution through a special foam generating
device that produces said foam using hypoxic air;

said foam, propelled further with said hypoxic air, being released into protected area, which
allows to rapidly control and extinguish a fire.

43. (Previously presented) The system and method according to claim 41, wherein the oxygen
content in said composition is maintained in the range from 12-15%.

44. (Withdrawn) The system and method according to claim 42, wherein the oxygen content in
said composition is maintained in the range from 12 – 15%.

45. (Withdrawn) The system and method according to claim 42, wherein
said foam is made from a standard fire-extinguishing foam solution that is normally used for
propelling with ambient air or nitrogen.

46. (Previously presented) A method for providing a hypoxic fire prevention environment in an
aircraft having a compartment comprising:

providing a source of hypoxic air having an oxygen content of less than 16% on board said aircraft;

supplying said hypoxic air into said compartment; and

establishing an oxygen content in said compartment in a range between 10% and 16% during a flight.

47. (Previously presented) The method of claim 46 wherein the compartment further comprises a cargo compartment and the establishing step establishes the oxygen content in said cargo compartment in a range of between 12% and 16%.

48. (Previously presented) The method of claim 46 wherein the compartment further comprises a fuel tank and the establishing step establishes the oxygen content in said fuel tank in a range of between 10% and 12%.

49. (Currently amended) The method of claim 46 wherein the compartment further comprises a fuel tank and the establishing step establishes the oxygen content in said fuel tank in a range above 12[9]% and below 16%.

50. (Previously presented) The method of claim 46 wherein providing the source of hypoxic air further comprises receiving a source of air; separating the source of air into an oxygen enriched component and an oxygen depleted component on board said aircraft; wherein said oxygen depleted component comprises said hypoxic air.

51. (Previously presented) The method of claim 50 wherein providing the source of hypoxic air further comprises providing a storage container containing hypoxic air under pressure, wherein the step of supplying said hypoxic air further comprises releasing said hypoxic air from said storage container under controlled conditions into said enclosed space.

52. (Previously presented) The method of claim 50 wherein the aircraft further comprises a human occupied compartment containing at least one breathing mask, the method further comprising supplying said oxygen enriched component to said breathing mask in said human occupied compartment for human consumption.

53. (Previously presented) The method of claim 50 wherein separating the source of air further comprises passing the air through a plurality of oxygen-separation membranes connected in parallel as a single unit.

54. (Previously presented) The method of claim 50 wherein separating the source of air further comprises passing the air through a plurality of pressure-swing adsorption units connected in parallel as a single unit.

55. (Previously presented) The method of claim 46 wherein providing a source of hypoxic air further comprises cryogenically producing nitrogen and oxygen from atmospheric air, and mixing nitrogen and air to form an oxygen-depleted gas mixture as said hypoxic air.

56. (Currently amended) The method of claim 46 wherein the compartment further comprises a passenger cabin, and the establishing step establishes the oxygen content in said passenger cabin in a range above 12[9]% and below 16%.

57. (Previously presented) The method of claim 56 wherein the establishing step establishes that the oxygen content in said passenger cabin in a range of between 12% and 16%.

58. (Currently amended) [A system for] An aircraft fire prevention system [for an aircraft] comprising:

an aircraft having an exterior surface and at least one interior compartment;

a source of hypoxic air on board said aircraft connected to supply said hypoxic air to said compartment; and

a hypoxic atmosphere maintained in said compartment, said atmosphere having an oxygen content of between 10% and 16% at a time during a flight.

59. (Previously presented) The system of claim 58 wherein the at least one compartment further comprises a fuel tank.

60. (Currently amended) The system of claim 59 wherein the hypoxic atmosphere in said fuel tank further comprises an oxygen content of between [above] 12[9]% and 16%.

61. (Previously presented) The system of claim 59 wherein the hypoxic atmosphere in said fuel tank further comprises an oxygen content of between 10% and 12%.

62. (Previously presented) The system of claim 58 wherein said source of hypoxic air further comprises a storage container containing hypoxic air under pressure, and a valve for releasing said hypoxic air from said storage container under controlled conditions into said enclosed space.

63. (Previously presented) The system of claim 58 wherein said source of hypoxic air further comprises means for separating air into an oxygen enriched component and an oxygen depleted component, wherein said oxygen depleted component comprises said hypoxic air.

64. (Previously presented) The system of claim 63 wherein the aircraft further comprises a human occupied compartment containing at least one breathing mask, wherein said oxygen enriched component is supplied to said breathing mask in said human occupied compartment for human consumption.

65. (Previously presented) The system of claim 63 wherein said separating means further comprises a plurality of oxygen-separation membranes connected in parallel as a single unit.

66. (Previously presented) The system of claim 63 wherein said separating means further comprises a plurality of pressure-swing adsorption units connected in parallel as a single unit.

67. (Previously presented) The system of claim 63 wherein said source of hypoxic air further comprises a storage container containing hypoxic air under pressure, and a valve for releasing said hypoxic air from said storage container under controlled conditions into said compartment.

68. (Previously presented) The system of claim 58 wherein said source of hypoxic air further comprises a storage container containing hypoxic air under pressure, and a valve for releasing said hypoxic air from said storage container under controlled conditions into said compartment.

69. (Previously presented) The system of claim 58 wherein the source of hypoxic air further comprises a cryogenic device that produces nitrogen and oxygen from atmospheric air, and means for mixing nitrogen and air to form an oxygen-depleted gas mixture as said hypoxic air.

70. (Previously presented) The system of claim 58 wherein the at least one interior compartment further comprises a human-occupied passenger compartment.

71. (Previously presented) The system of claim 58 wherein the at least one interior compartment further comprises a cargo compartment.